



Evaluation of growth potential of *Listeria monocytogenes* and *Salmonella* in a sandwich environment

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Introduction

Objective

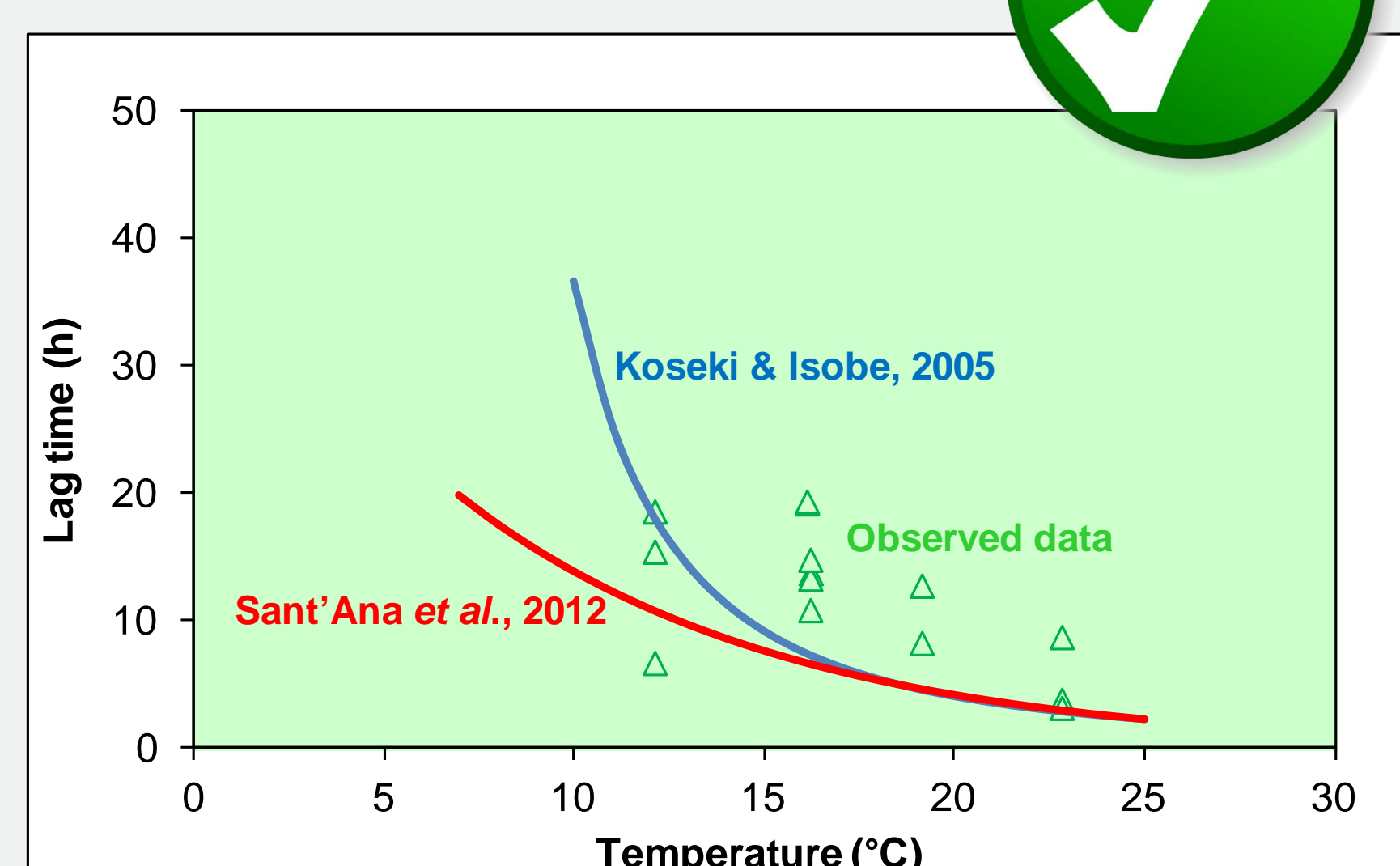
Sandwich environment

Extrinsic environment: Sandwich handling practices, storage and serving conditions were collected from four catering units. Temperatures in the range from 3 to 22 C and time intervals from a few hours at room temperature to several days of refrigeration were observed.


Data describing the effect of temperature on max. specific growth rates and lag times of *Salmonella* and *L. monocytogenes* on lettuce and cooked chicken were collected from literature. For evaluation of the collected data, challenge tests were conducted at temperatures between 7 and 23 C on Lollo Bionda lettuce pieces (5 x 5 cm²) and slices of cooked chicken filets.

Conclusion

- ## Salmonella

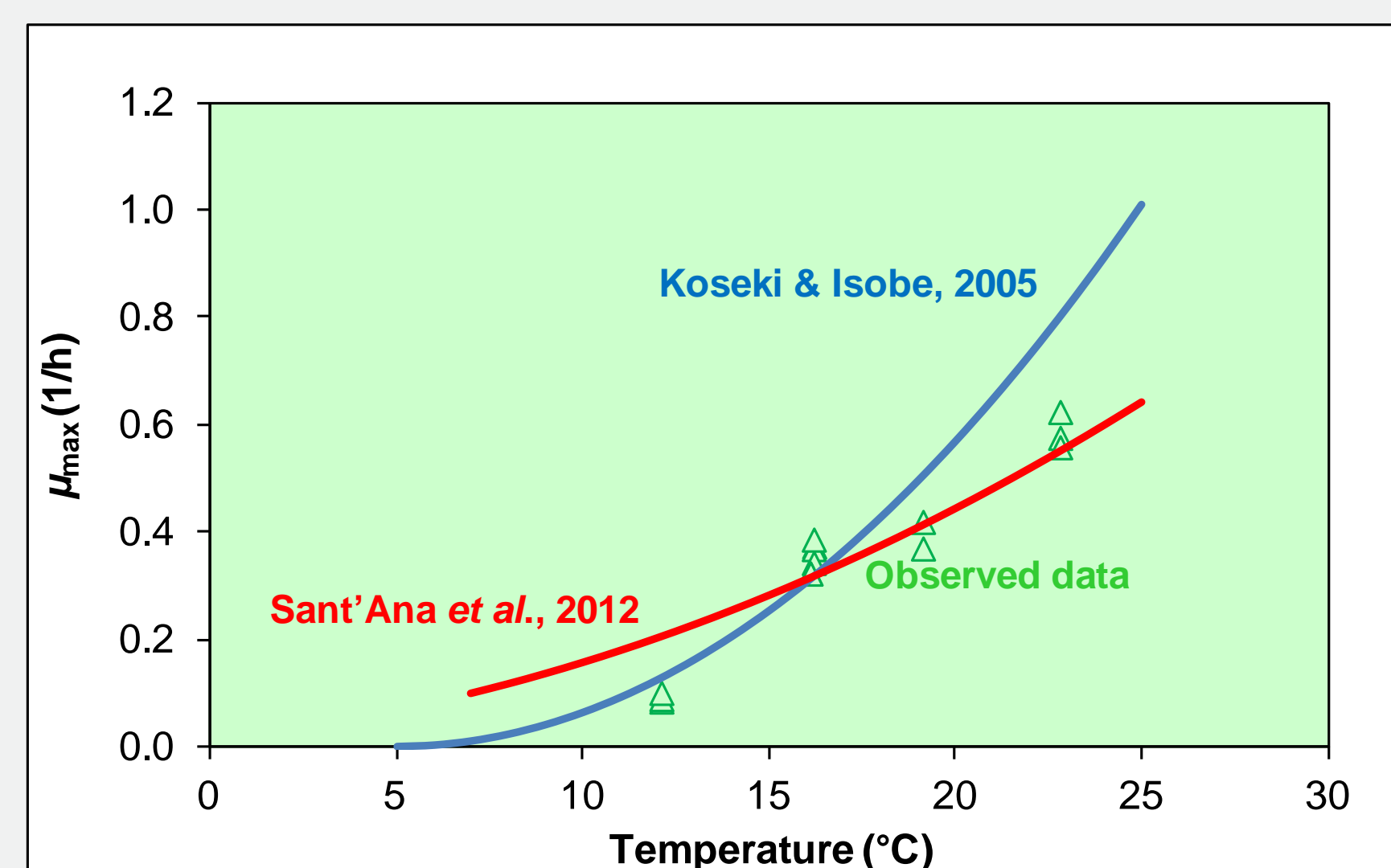


(37°C, 24h)

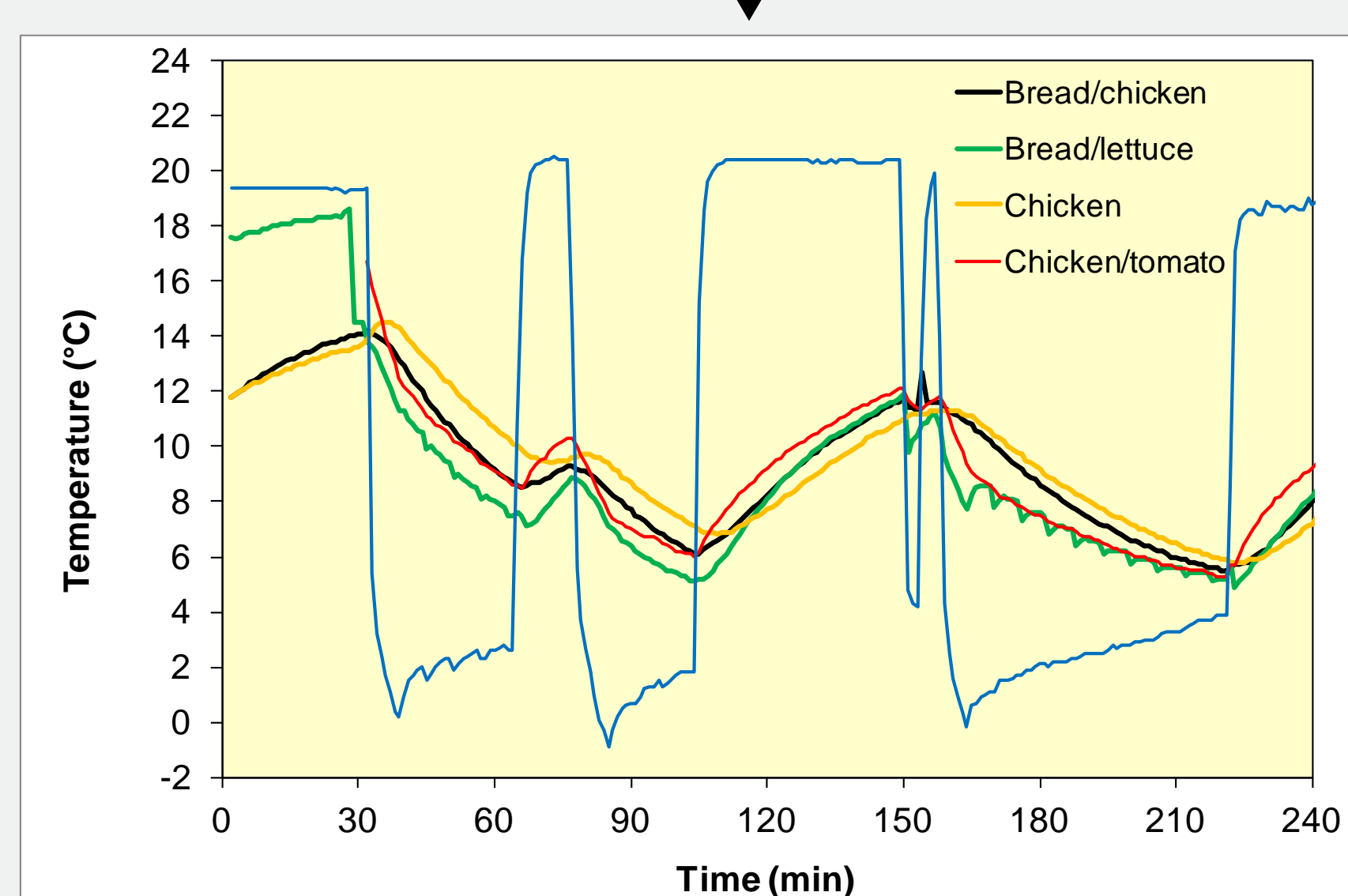
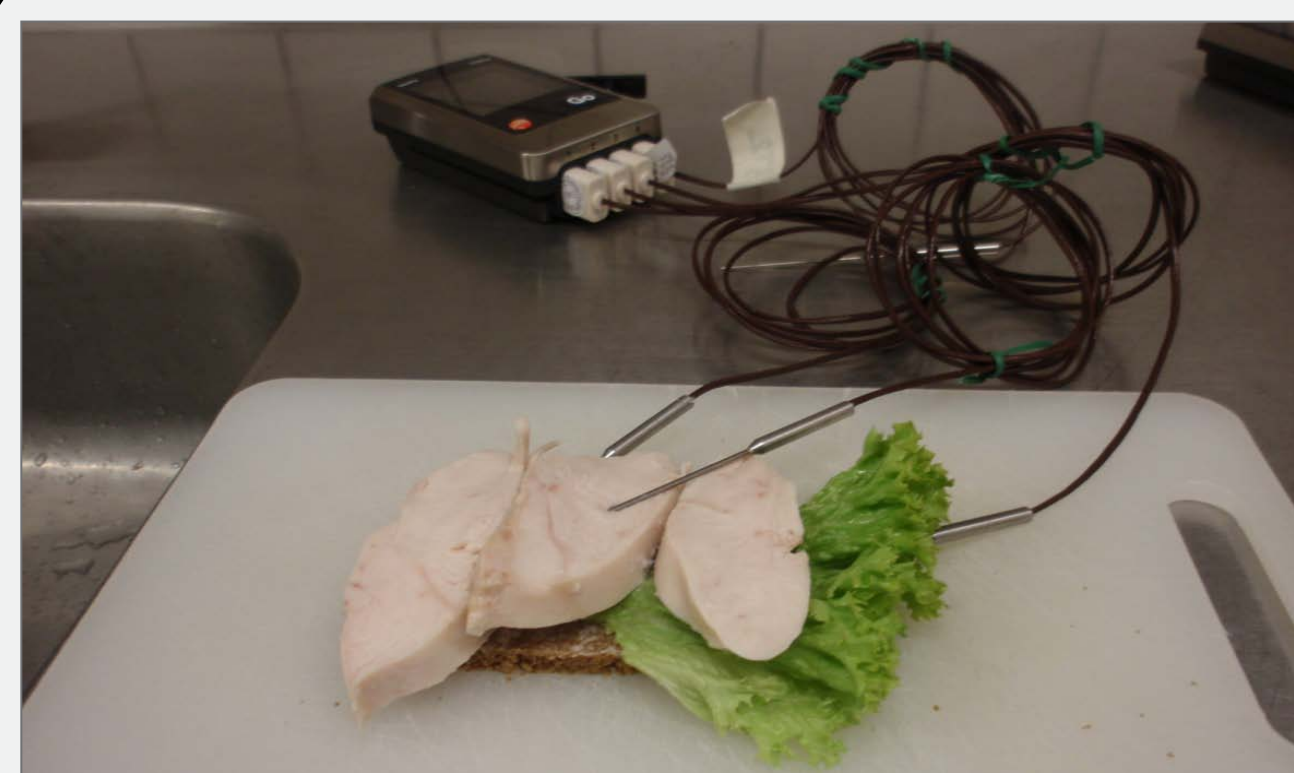


ca. 5000 CFU
per piece

- S. Enteritidis phage type 6, raw-egg-cake
- S. Typhimurium DT104, chicken
- S. Newport, alfafa seeds
- S. Weltevreden, sprout outbreak



Ex. temperature profile



Source: Majbritt Kofoed Larsen

Compliance with literature data?

Pathogen	Lettuce		Cooked chicken	
	Lag	μ_{\max}	Lag	μ_{\max}
<i>Salmonella</i>	✓	✓	✓ ($\geq 10^{\circ}\text{C}$) X ($< 10^{\circ}\text{C}$)	✓
<i>L. monocytogenes</i>	✓ ($\geq 15^{\circ}\text{C}$) X ($< 15^{\circ}\text{C}$)	✓	X	X

Data analysis

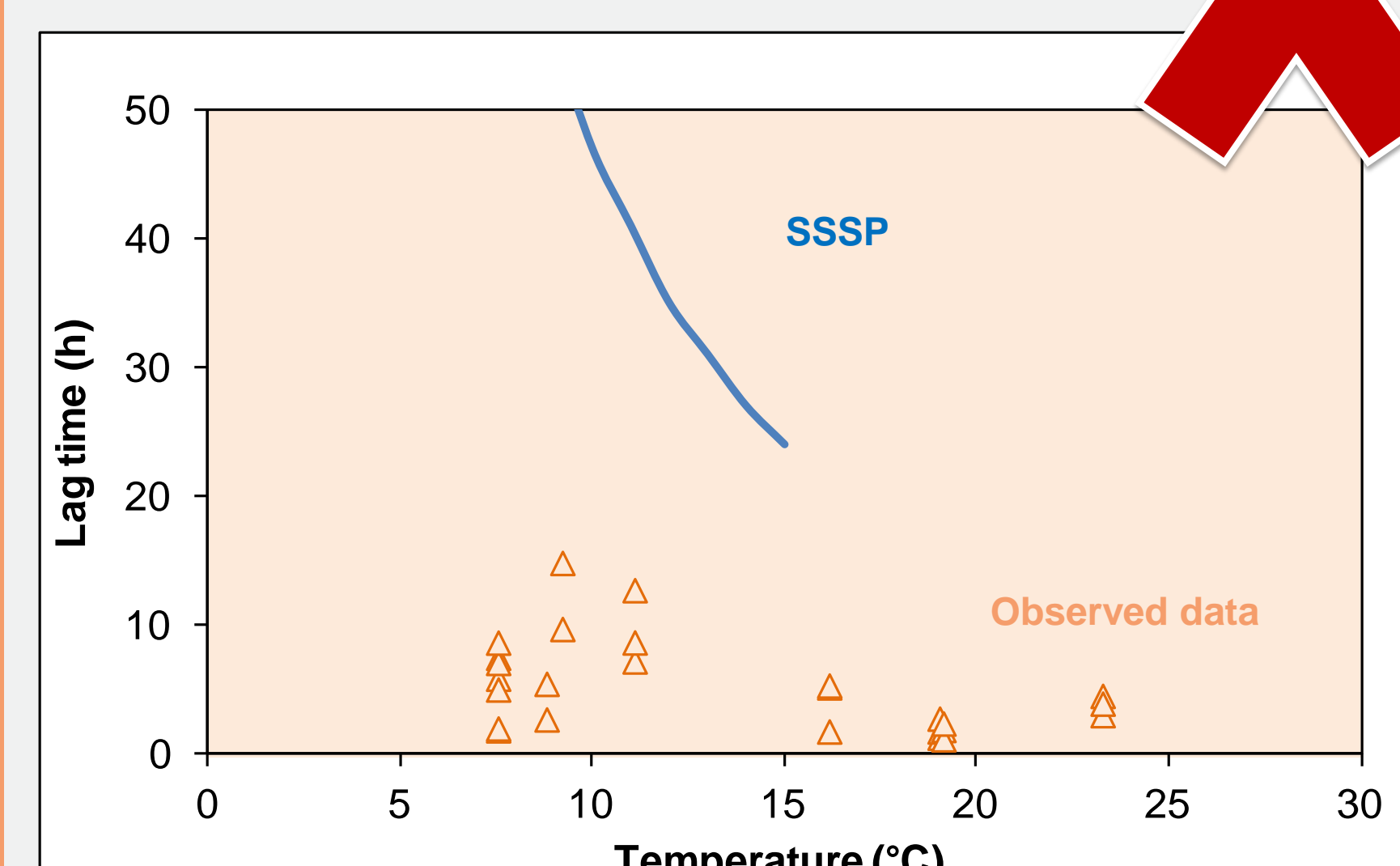
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Listeria monocytogenes



(30°C, 2d)

ca. 5000 CFU
per slice

L. monocytogenes type 1, vegetables
L. monocytogenes, smoked salmon
L. monocytogenes type 4, gravad salmon
L. monocytogenes, bacon

